

Interestingly, of the several (105) trees in the first location belonging to 15 species of 11 genera, only two plants of *C. guildingi* and *C. speciosa* plants not pruned and maintained properly were infested by the parasite, indicating the parasites' preference to these neglected plants, while the other plants of *Calliandra* spp. which were pruned regularly were free from *S. parasitica*. Periodical pruning a little below the point of infestation would result in the selective elimination of the parasite along with its haustoria.

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D. NUTHAN

Associate Professor, Department of Forestry,

M. VASUNDHARA

Assistant Professor, Division of Horticulture,

University of Agricultural Sciences, GKVK,

Bangalore-560 065.

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## 36. TWO NEW RECORDS OF ASTERACEAE FOR ANDHRA PRADESH

During the course of floristic studies on Asteraceae in Andhra Pradesh, India, some interesting specimens were collected from the Eastern Ghats. After critical studies on the specimens, thorough perusal of literature and authenticated specimens in various herbaria, viz. MH and CAL, these were identified as *Adenostemma lavenia* (L.) O. Ktze, var. *angustifolium* (Clarke) Koster and *A. lavenia* (L.) O. Ktze. var. *madurense* (DC.) Panigrahi which are new distributional records for Andhra Pradesh. An artificial key, description along with nomenclatural citations, distribution, ecological and phenological data are given for both the taxa.

*Adenostemma* J.R. Forster et J.G.A. Forster

1. Leaves broadly ovate, chartaceous, distinctly dentate to serrate-dentate, achenes more than 4 mm long, minutely glandular to glabrous ..... var. *madurense*

1. Leaves lanceolate, coriaceous, serrate or crenate, achenes less than 3 mm long, muricate ..... var. *angustifolium*

1. Leaves maximum 10 cm broad, crenate to serrate, achenes densely warty ..... var. *lavenia*

***Adenostemma lavenia*** (L.) O. Ktze., Rev. Gen. Pl. 1: 304.

1891. var. *angustifolium* (C.B. Clarke) Koster in *Blumea* 1: 475. 1935; Panigrahi, *Kew Bull.* 30 (4): 652. 1975.

*A. angustifolium* Arnott in *Nov. Act. Nat. Cur.* 18. 347. 1836; DC., *Prodr.* 7:266. 1838; Grierson in *Dass. & Fosb. Rev. Handb. Fl. Ceylon.* 1:138. 1980. *A. viscosum* J.R. & G. Forst. var. *angustifolium* C.B. Clarke, *Fl. Brit. Ind.* 3:242. 1882. Pro parte.

Erect herb, 30- 50 cm, stem glabrous. Leaves opposite, 3.5 - 13 x 0.8 - 2 cm, base attenuate in lower ones, obtuse in uppermost ones, entire in the lower half, crenately serrate to serrate in upper half, obtuse. Heads solitary or a few in terminal corymbs, 6 mm, white, homogamous, not rayed; peduncle 0.6 - 2 cm, puberulous and glandular. Involucral bracts 18, 2-seriate, 4-4.5 mm, oblong or narrowly oblong-elliptic, 3-veined, pubescent on dorsal side, obtuse or obtusely apiculate. Receptacle alveolate, 2 mm across. Florets 30 - 34, corolla 3 mm long, 5-lobed; lobes ovate, obtuse, glabrous, sparsely hairy at base on dorsal side. Stamens 5; anthers oblong, 1 mm long obtuse at base, hood ovate, obtuse. Style 5.5 mm, exerted; exertion 2 - 2.5 mm; branches 3-3.5 mm, spatulate, obtuse. Pappus of 3-5 clavate scales, 0.4 mm long, basally united to form a ring. Achene oblanceolate, 1.6 - 2 mm, muricate.

Ecology: Along the streams in forests, rare.

Flowering: October - January.

Distribution: India: Andhra Pradesh, Assam, Konkan, U.P., Bengal.

World: Sri Lanka, (Myanmar) Burma, Thailand.

Specimens examined: Talakona (Chittoor district), C.P. Raju 13245.

*Adenostemma lavenia* (L.) O. Ktze. var. *madurensense* (DC.) Panigrahi in Kew Bull. 30 (4): 654. 1975; R.R. Rao *et al.*, Fl. Ind. Enum. - Ast. 12. 1988 *A. madurensense* DC. in Wt., Contrib. Bot. Ind. 9. 1834. *A. viscosum* J.r. Forst. & J.G. Forst. var. *reticulatum* Hk. f., Fl. Brit. Ind., 3:242. 1881. pro parte.

Erect herb, 30-100 cm; stem glandular pubescent. Leaves opposite, sparsely puberulous, 2-17 x 1-11 cm, obtuse-attenuate at base, serrate-dentate, apex acute. Heads few, terminal on divaricating branches, white, 7 mm long, homogamous, not rayed; peduncle up to 2 cm, densely glandular and pubescent. Involucral bracts 13, sub-biseriate, elliptic, obovate or elliptic-oblong, 4.5 - 5.5 mm, very sparsely glandular and hairy on dorsal side towards base, margin usually ciliate with glands, obtuse or minutely dentate. Receptacle alveolate, 1-2 mm across. Florets 18 - 20, corolla 3 mm long, 5-lobed; lobes ovate, 0.5 mm long, densely hairy on dorsal side, acute. Stamens 5; anthers

linear-oblong, 1 mm, hood retuse at apex, base truncated to obtuse. Style 5 mm, exerted to 2.5 mm, branches 3.5 mm, broad, spatulate, obtuse. Pappus of 3 clavate scales, on a short ring, 1 mm. Achene compressed, oblanceolate, 5 mm, slightly curved, young ones yellow, matured black, minutely glandular.

Ecology: Along streams at higher elevations, rare.

Flowering: August - January.

Distribution: India: South India, Assam.

World: Malaya, Myanmar (Burma), Sri Lanka.

Specimens examined: Anantagiri (Visakhapatnam district), C.P. Raju 9959.

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R.R. VENKATA RAJU  
C. PRABHAKAR RAJU  
Department of Botany,  
Sri Krishnadevaraya University,  
Anantapur - 515 003, India.

### 37. SUN-TRACKING IN *RANUNCULUS HIRTELLUS* ROYLE EX D.DON.

(With one text-figure)

The facility with which heliotropic leaves and flowers turn to face the sun has for so long been part of nature lore that it may well be surprising to the casual observer that so little is known of the mechanism of perception and response of foliar orientation (Smith, 1984). Heliotropic movement by flowers have been described for over a century (Hooker, 1881). Kevan (1972) defined these heliotropic movements or heliotropism as the "diel bending response or turning of plants directly to and with the sun". It is now known that heliotropic movements are mediated by changes in cell turgor pressure (Vogelmann, 1984). Heliotropic movements

have been studied in detail in the arctic flowers like *Dryas integrifolia*, *Papaver radicum* Kevan, 1975), tropical alpine flowers like *Oritrophium limnophilum* (Smith, 1975), alpine flowers like *Ranunculus adoneus* (Stanton and Galen, 1989), in leaves of *Lavatera cretica*, *Malva parviflora* (Koller, 1980) etc.

Heliotropism in the flowers of alpine plants growing in the Himalayan arc have still not been noticed. The Himalayan alpine zones, similar to other alpine zones of the earth, are very cold and any biotic mechanism such as heliotropism for maximizing use of small heat budget in the form of solar radiation is